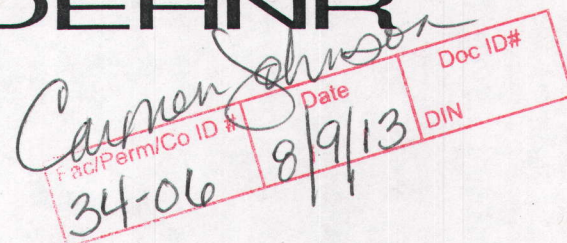


State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

June 15, 1994

Peter J. Walls
RUST Environmental & Infrastructure
P.O. Box 24000
Greenville, S.C. 29616



RE: Review Of The Design Hydrogeologic Report For The Piedmont
Landfill And Recycling Center (Permit # 34-06)

Dear Mr. Walls,

The Solid Waste Section has reviewed the above referenced report. Several questions have been raised from the review of the report. Please provide a response to the following questions and comments:

The report has been signed by a Professional Geologist, however a copy of the Temporary Registration letter of N.C. Professional Geologist Certification should be included in the Design Hydrogeologic Report.

What is the acreage of the new area to be developed?

What is the design of Phase I, Modules 3 and 4? (Page 1-2)

When will the remaining onsite water supply well be abandoned? (Page 2-6)

What is the average monthly rainfall for the months of January, February, and March, 1994, when the recent hydrogeologic investigation took place? (Figure 2-2)

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. (Figures 2-3 and 2-4)

What is the source of the ranges of hydraulic conductivity values? They do not appear to match the values in Appendix D. (Page 3-5)

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. (Figure 3-1, Boring Location Plan)

It is not clear why "A quartzitic unit is ... assumed to be oriented in a northeast-southwest direction around P-16". (Page 4-4)

Boring P-2D does not appear to be plotted correctly on Geologic Section D-D'. (Figure 4-1D)

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. (Figure 4-2, Top Of Bedrock Map)

Why is the top of bedrock data for boring P-16 plotted at an elevation of 776, when according to the boring log for P-16 rock was encountered 17 feet below the ground surface at an elevation of approximately 794? (Figure 4-2)

According to the boring log, rock was encountered at an elevation of approximately 781.5 for boring GP-1DD rather than an elevation of 780. (Figure 4-2)

How were the ranges for the hydraulic conductivity values determined? They do not appear to match the values reported in Appendix D. (Page 5-4)

What are the average hydraulic conductivities and average hydraulic gradients used in the average velocity calculations, and how were these values determined? (Page 5-4)

How were the porosity values determined that are used in the average ground water velocity calculations? Is porosity test data available for each lithologic unit of the uppermost aquifer? (Page 5-4)

Please provide the ground water flow velocity calculations. (Page 5-4)

Please correct or clarify the following statement: "The ground water then tends to flow from the southeast corner radiating out from the west to the north with an approximate horizontal gradient of ...". (Page 5-4)

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. (Figure 5-1, Potentiometric Map)

The vertical gradient data was variable. What data was used to prepare the Hydrogeologic Sections? The potentiometric data used to prepare the cross-sections should be shown and the equipotential lines should be labeled with potentiometric levels on the Hydrogeologic Sections. (Figures 5-2*)

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. Also the boring locations should be plotted on the map, along with any data used in the preparation of the potentiometric map. (Figure 5-3, Seasonal High Potentiometric Map)

The Seasonal High Potentiometric Map was updated in the Water Quality Monitoring Plan. This revised potentiometric map should be submitted in the Design Hydrogeologic Report. (Figure 5-3)

How was the Vertical Separation data determined for Table 5-2? It does not appear to match the piezometer construction records. The vertical gradient data was variable. What vertical gradient data was used to prepare the Table 5-2? Please provide these gradient calculations. (Table 5-2)

Comparing the piezometer construction records and the boring logs leads to the following comments on the Screened Zone designations in Table 5-3. The screen for piezometer P-5 appears to be in the bedrock, however the screened interval (sand filter pack) bridges the partially weathered rock and the bedrock which would influence hydraulic conductivity measurements. The screen for P-6-S appears to be in the residual soil. The screens for P-12-S and P-13 appear to be in the partially weathered rock. (Table 5-3)

What is the correct piezometer designation for GP-6 that is referenced in the next to last statement of the Conclusions? (Page 6-1)

Appendix A: Why is no soils information reported for boring P-3 until a depth of 39 feet and for boring P-4 until 49 feet? Is the RQD value of 0.5 correct for P-12 at depth 59 feet? Why was the coring location for boring P-16 moved approximately 80 feet from the original boring location?

Appendix B: For boring P-8-D the boring completion date is reported as 3/8/94, yet the piezometer completion date as evidenced by the placement of the bentonite seal is reported as 3/4/94? For boring P-10 the total boring depth is reported as 39 feet but the piezometer is reported to be to a depth of 46 feet?

Appendix E: For the soils analysis, most of the soils tested for grain size analysis were not tested for Atterberg Limits, and most of the soils tested for Atterberg Limits were not tested for grain size analysis. This lack of coordination of soils analysis data makes it difficult to determine the soil classifications and to make other interpretations based on the soils data.

The Subgrade Plan (Drawing No. 2) should plot the locations of the borings in order to determine if the vertical separation requirements have been met.

WATER QUALITY MONITORING PLAN:

A number of comments and questions made in connection to the Design Hydrogeologic Report are also applicable to the Water Quality Monitoring Plan. In addition to these, please address the following questions and comments:

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. (Figure 2-10A, Seasonal High Potentiometric Map)

It is stated that "Leachate samples will be obtained from the leachate collection system periodically and submitted for analysis of the Appendix I parameters". How frequently are leachate samples to be taken? At a minimum, leachate samples should be taken semi-annually, at the time of the water quality monitoring events. (Page 3-4)

Detection monitoring wells should generally be located no more than 100 to 150 feet from the waste boundary. Generally monitoring wells screened at the water table should be constructed with 15 foot screens set so that the top of the screen is just above the seasonal high water table. (Page 3-5)

On the Monitoring Well Construction Summary Table, the Top Of Screen Elevations and the Bottom Of Screen Elevations do not appear to be correct, based upon a review of the Well Construction Records. How were the vertical gradients determined? Were the existing monitoring well borings taken to auger refusal? (Table 3-1)

Site maps and plans should be supplied at a size and scale that will permit meaningful interpretation of information. Also there should be enough of off-site topography to enable interpretation of topographic trends that would assist in interpretation of ground-water flow. (Figure 3-1)

The reporting date for the results of the baseline sampling of the Phase 3 area should be based upon the date the Permit to Operate is issued. (Page 4-1)

Purging of monitoring wells should be done until field parameters have stabilized, but at least three to five well volumes should be evacuated. (Page 4-4)

Lab certification, sample analytical methodologies, and detection limits should be consistent with the rules and policies of the Solid Waste Section. The Section is in the process of preparing a revised policy statement on these issues. (Page 4-7, and Table 4-1)

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The office for the Solid Waste Section has a different zip code from our Post Office Box. The zip code for our street address is 27605. The zip code for our P.O. Box address is 27611. Mail should be addressed to the Solid Waste Section.

A copy of the Temporary Registration letter of N.C. Professional Geologist certification should accompany the Water Quality Monitoring Plan. (Page 5-1)

The Typical Monitoring Well Schematic varies from specifications required by North Carolina rules and policies. (Appendix C)

Please provide a response to the questions and comments contained in this letter as soon as possible so the Solid Waste Section can complete its review of the Construction Plan Application. If you have questions regarding this letter, please contact me at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Sherri Hoyt
Ed Gibson